FLIGHT

The AIRCRAFT ENGINEER and AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

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Sept. 28.... Schneider Cup Seaplane Race at Cowes
Oct. 4 .... R.Ae.S. Inaugural Lecture
Oct. 8–13 Light 'Plane and Glider Competitions, Lympne
Oct. 12 .... "Some Aspects of an Attempt to Fly Round the World," by Maj. W. T. Blake, before I.Ae.E.
Oct. 14 .... Beaumont Cup Race at Istres, France
Oct. 18 .... "The Manœuvres of Inverted Flight," by Sq.-Leader R. M. Hill, before R.Ae.S.
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Nov. 1 .... "Present Developments in Aircraft Instruments," by Major Wimperis, before R.Ae.S.
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EDITORIAL COMMENT.

ONCE more the Aeronautical Research Committee, under the Chairmanship of Professor Sir Richard Glazebrook, K.C.B., F.R.S., has issued its Annual Report, extracts from which are published elsewhere in this issue of FLIGHT. From the Report it is gratifying to find that the A.R.C., although admitting that progress has been slow, express the opinion that there is a distinct improvement in the outlook for research. The Committee, however, draw attention to two points on which stress was laid in the previous Annual Report of the Committee, and which do not yet appear to have received the official attention which their importance merits. The money devoted to fundamental research, it is stated, is a small percentage of the total vote for supply and research, and the Report points out that to obtain what may be termed quality to make up for lack of quantity it is necessary to allot larger sums for research purposes. This is a view which we have repeated and emphatically expressed in these columns, and is a fact which should, we think, be so obvious as to require no stressing. Nevertheless, it seems that those responsible for deciding what class of work is to be undertaken by our Government research establishments have not yet realised the importance of not starving fundamental research in favour of *ad hoc* experiment.

Research

Then occurs a passage in the Report which we cannot refrain from quoting. After pointing out the advisability of retaining the services of a highly-trained technical staff, the Report continues: "Funds devoted to research by these staffs will give a better return to the State than the offer of large sums as prize money for limited lines of attack on the problems of flight." Now, obviously this reference cannot be aimed at the very limited form of Government financial encouragement offered in the form of a promise to buy, for £3,000, the British machines winning the Aerial Derby and the Schneider Cup (if fortune should favour the British defenders of the latter), as the reference is distinctly to "large sums as prize money." To what does the passage refer? Can it be that this august body known as the Aeronautical Research

Committee has a sense of humour, and that the passage refers to the offer by the Government of £50,000 for a helicopter? Frankly we cannot read into the sentence any other interpretation, and if that be indeed what the Committee has in mind, we think it augurs well for the future of research in this country. Our own opinion of the helicopter has been stated frankly and frequently, and the passage quoted appears to us to indicate that the Aeronautical Research Committee possibly shares these views.

The question of airship research is again referred to, and the opinion, expressed previously, that before we can make further progress in airship design further full-scale experiments are necessary, is still held by the Committee. We referred to this question some weeks ago, expressing doubt as to the feasibility of building, without further experiment, very large airships without introducing experimental features of doubtful merit.

On the subject of accidents it is gratifying to find that the Committee has recommended that the Air Ministry should appoint a group of technicians to spend their whole time in investigating the various power plant stoppages which occur from time to time at different air stations. It is thought that the resulting saving in aeroplanes and engines written off would more than make up for the cost of maintaining such a body.

A tabulated analysis of returns by the various squadrons of the R.A.F. of power plant failures for a six months' period is interesting, but is rather discounted by a statement in the Report to the effect that the information supplied is derived from reports made by officers who, in many cases, are not in a position to give such technical details as are necessary to determine the true causes of the stoppage. Evidently it is due to this opinion that the Committee has recommended the formation of a group of technicians.

One of the most important problems awaiting solution at the present time is that of control at low speeds. The Report refers to the subject, and it is stated that two new suggestions bearing on this problem are now the subject of experiment. One of these is in the form of a variable opening on the suction side of a wing, connecting with an opening on the pressure side, the lift on the higher wing being reduced by increasing the opening. This arrangement has the advantage that the yawing moment is reduced, instead of being increased as it is with the usual type of aileron control. The second form of control that has been suggested consists of a hinged flap, mounted behind the leading edge of the wing and opening downwards. It is stated that wind channel experiments indicate that the second arrangement appears to be slightly better than the first, and that both have been found to give their maximum effect at the stalling angle. While we appreciate that a very great deal of valuable work on controllability has been done by the Government establishments, notably at the R.A.E., we think a certain amount of credit might have been given to the private firms who have been experimenting on the same problem, and who have obtained results which, to say the least, promise well for the future solution of this highly important problem.

Italy's Air Attachés

SIGNORI SCATONI and Calderara have been appointed Air Attachés to the Italian Embassies in London and Washington respectively.

First Chicago–New York Night Flight

A FEW particulars are now to hand of the first night flight from Chicago to New York, which was carried out on July 26-27. The machine used was a J.L.6 (otherwise Junkers), and the pilot was Eddie Stinson, who carried as passengers Mr. Charles Dickinson, President of the Aero Club of Illinois, and Mr. Arthur Gray, a mechanic. The start of the non-stop flight was made from Chicago at midnight (eastern standard time), and the distance of 750 miles was covered at an average speed of 88 m.p.h., the machine alighting at Curtiss Field, Garden City, L.I., at 7.30 a.m. the following morning. As far as Cleveland a full moon made course-keeping fairly easy, but afterwards it was obscured by clouds, and from Cleveland until the machine was well over Pennsylvania, when daylight broke, the aviators had to fly in total darkness.

American Round-World Attempt

FROM New York it is reported that six aeroplanes are now under construction at the College Point, L.I., works of the L.W.F. Company. These machines, it is stated, are intended for an American attempt to fly round the world. The flight will be made from west to east, starting from New York and proceeding by way of Newfoundland, Greenland, Iceland, Scotland, England, France, and along the Mediterranean to Egypt. From there the route will follow the Cairo-Baghdad air line, and onward by India, Bangkok, Saigon, the China coast, Hongkong, Tokyo. The return journey will then be made across the Pacific by way of the Kurile Islands, the Aleutians, and Alaska.

Speeding Up Our U.S. Mails

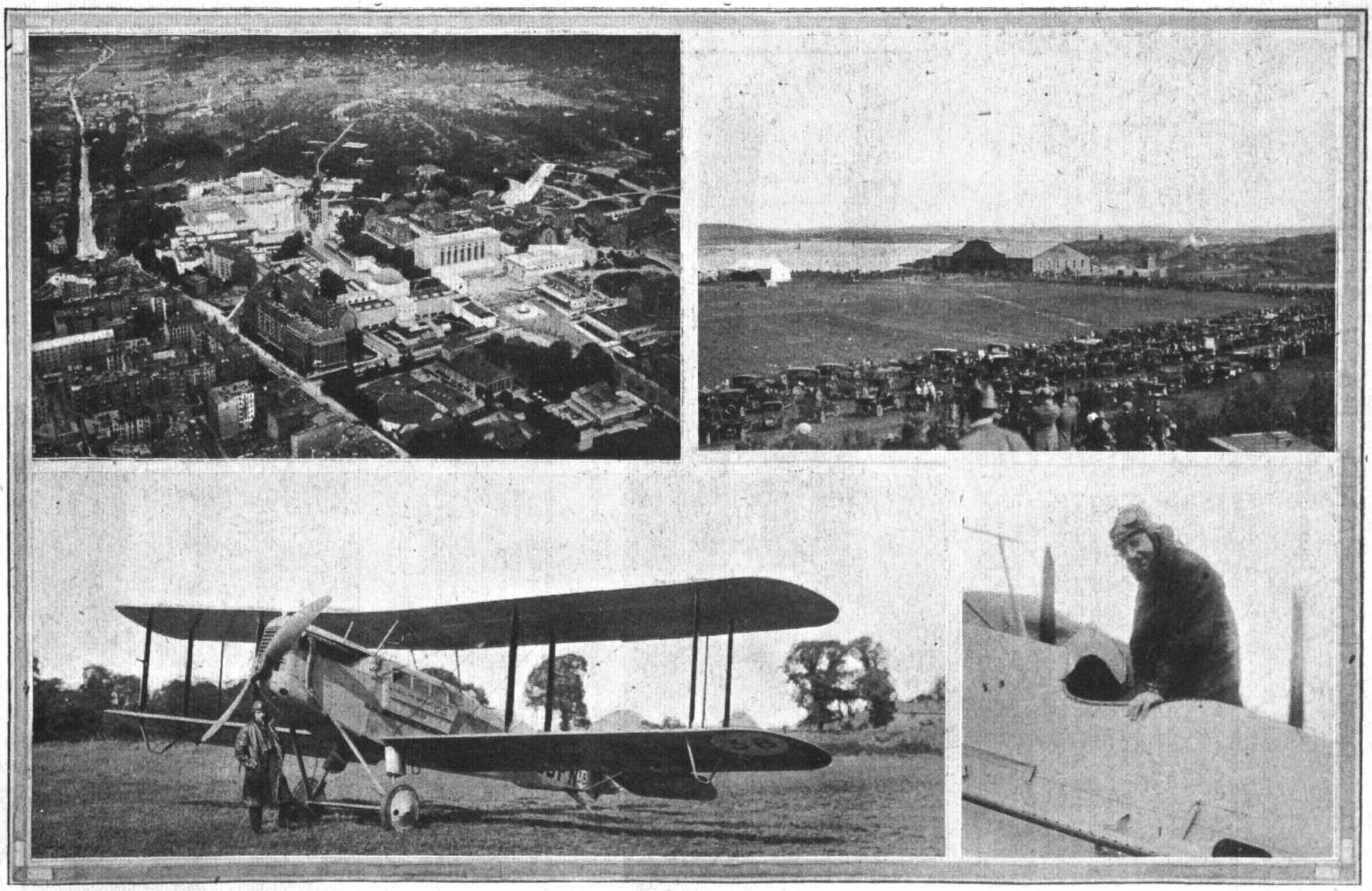
SOME little time back, it will be remembered, experiments were carried out by the Air Ministry and the Instone Air Line with the object of ascertaining if it were possible to intercept mails from America at Plymouth and hurry them on to London by air. A further similar series of tests are to be carried out shortly, extending over a period of about four weeks. This time, however, the Air Ministry has obtained the services of the De Havilland Aircraft Company, of Stag Lane, Edgware, who have allotted three D.H.9 machines, fitted with 240 h.p. Siddeley "Puma" engines. The experiments will be carried out as follows: Twenty-four hours' notice will be given by incoming liners from U.S.A. as they approach Plymouth. The steamer will be met on arrival by a post office launch, which will collect the mail bags intended for the North of England and Ulster, and will, on returning to port, hand them over to the waiting aeroplane. The latter will then proceed immediately to Manchester, where the mails will be handed over to the post office; those destined for Ulster will be immediately dispatched by air to Belfast, where they will be handed over to the postal authorities there. On the return journey the same procedure will be followed as far as Birmingham. Here the experiments will, at present, finish, but it is intended, under actual conditions, that the mails should proceed by air to Southampton, where they would be picked up by the outgoing steamers. It is hoped that the data obtained from the tests described above will be sufficient to demonstrate the possibilities of the service. In these tests dummy bags will be employed. The Joint Committee of the Air Ministry and the Post Office, which is now (the Wrights first flew in 1903!) considering the possibilities of air transport for mails, should obtain some useful information from these experiments. However, the committee consists of the right men: Major-General Brancker, Brig.-General Williamson (Director of Postal Services) and Lieut.-Col. Moore-Brabazon, M.P., as chairman.

Private Secretary to Sir Samuel Hoare

SIR SAMUEL HOARE, Secretary of State for Air, has appointed Mr. C. Ll. Bullock to be his Principal Private Secretary in succession to Air-Commodore E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., Royal Air Force, Air Secretary and Principal Private Secretary, who has been transferred to other duties on promotion.

Wireless Station at Zurich Aerodrome

IN connection with the extension of the Handley Page London-Paris air service to Zurich, a temporary wireless telephone station was established at the Zurich aerodrome by Marconi's Wireless Telephone Company at very short notice. Within six days of the order being received in London the station was in operation at Zurich. It consists of a Marconi standard A.D.2 aircraft transmitter and receiver, with sub-control attachment. Marconi aerodrome stations are now in operation at Croydon, Haren, Ostend, Cologne, Geneva, and several aerodromes in Spain.



A D.H.50 AT GOTHENBURG : Scoring 999 points out of a possible 1,000, the Traffic Competition at the Gothenburg Meeting was won by the new de Havilland type 50. In the above photographs the upper left-hand picture shows the Jubilee Exhibition from the air, with, on the right, a view of Gothenburg's aerodrome at Torslanda. Below is a view of the D.H.50 and, on the right, Mr. Cobham getting out of his cockpit immediately after winning the competition (*see pp.* 536–7).

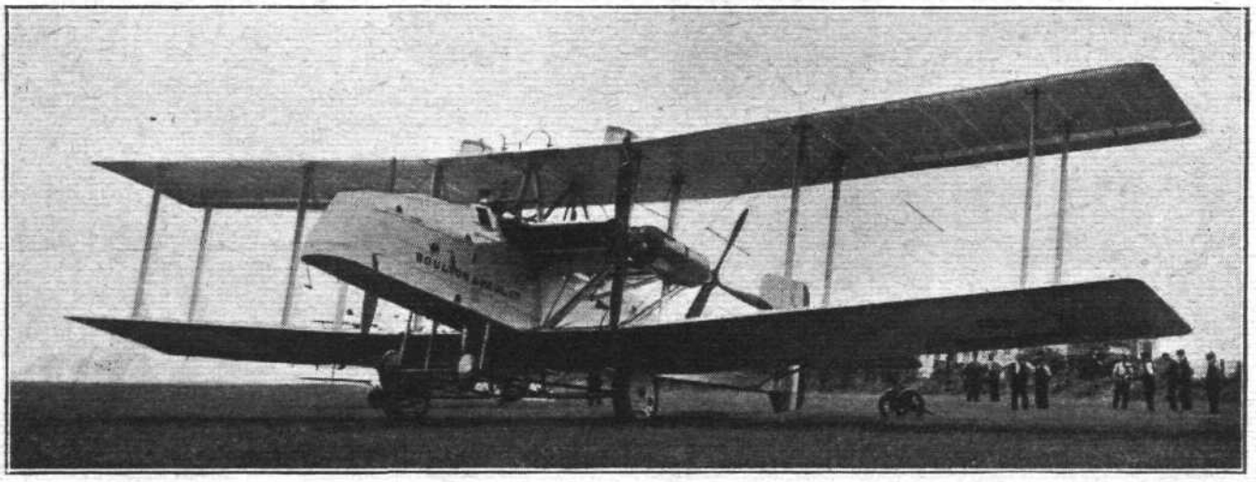
THE BOULTON AND PAUL "BODMIN"

An Exceptionally Interesting British All-Metal Machine

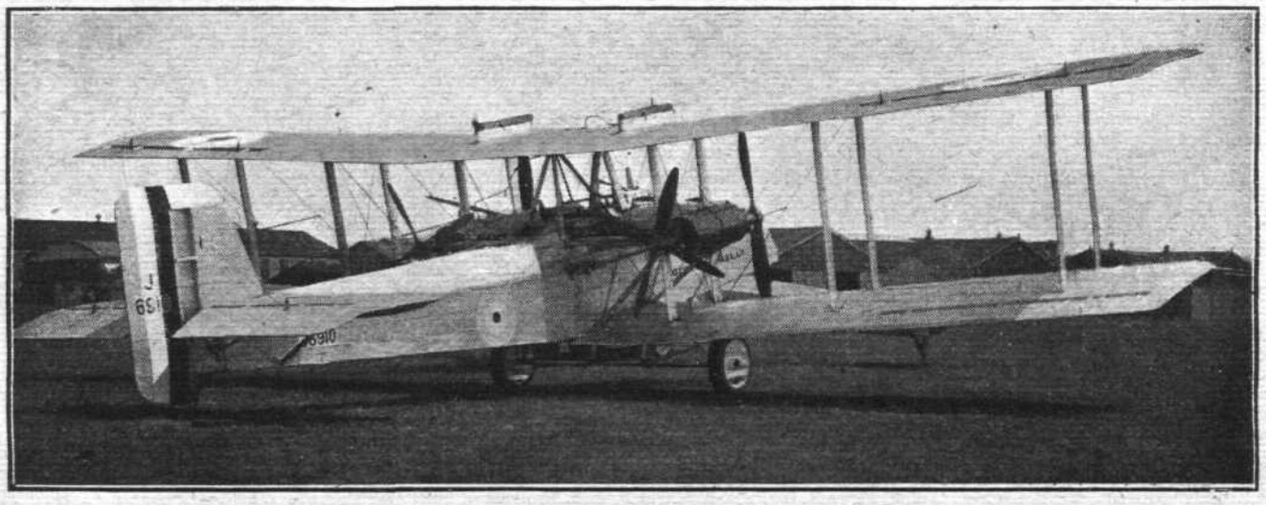
IT is now several years since Boulton and Paul, Ltd., of Norwich, decided, as a result of very extensive experimental research work on metal construction, to specialise on all-metal aircraft, and since that decision was taken several different types of all-metal machines have been produced. As, however, these were built for the Air Ministry, it has not been permissible to refer to them in detail, and all that it has hitherto been possible to give in FLIGHT is external views of some of the types. The consequence has been that far less has become generally known about the really wonderful work being carried out by this firm than the character of the work merits. It is, therefore, with considerable satisfaction that we are able this week to give the first detailed illustrated description of a modern Boulton and Paul all-metal machine, the Air Ministry restrictions having been withdrawn as far as this particular type, the P.12, or "Bodmin," is concerned.

The Boulton and Paul "Bodmin" is of quite exceptional interest to the student of aeronautics, partly on account of its construction, but also because the design incorporates the unusual feature of twin engines placed in the fuselage, with transmission drive to propellers placed on the wings. The "Bodmin," or P.12, to give the machine its proper series number, was designed to an Air Ministry specification calling for central placing of the engines. It is not permissible to state for what particular purpose the machine is required, nor in which locality it is likely to be used, but the main object aimed at has been reliability—not merely reasonably good reliability, but the nearest approach to absolute reliability which, at the moment, it is humanly possible to provide. Consequently the whole power plant installation has been planned with this object in view, and other considerations, such as extra long range and great carrying capacity, have been given second place.

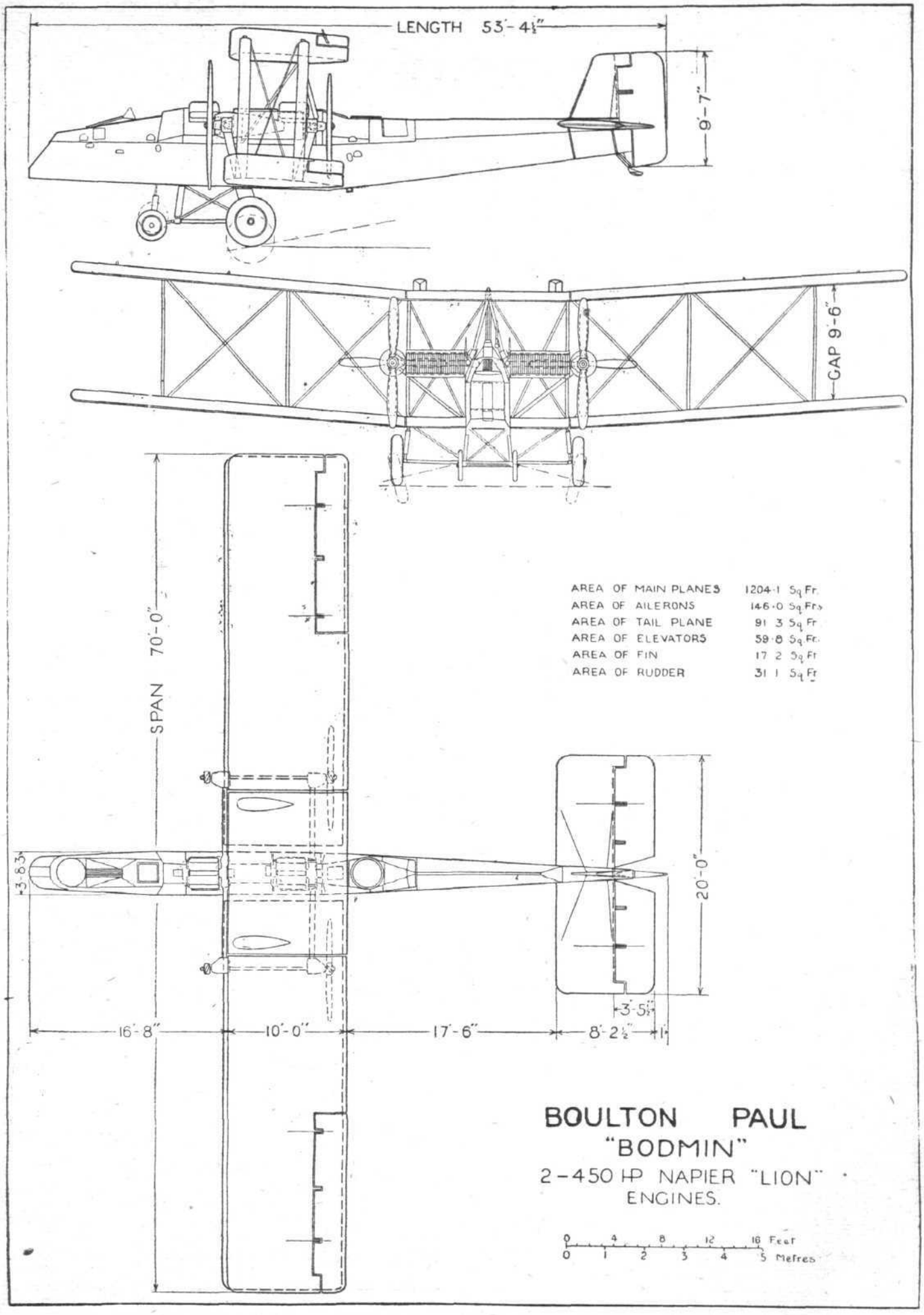
It will readily be understood that, however the problem is attacked, a machine with central engines and propellers on the wings must of necessity be heavier than one in which the engines are placed on the wings. Not only is there the extra weight of the transmission gear, but the fact that the engines are centrally placed increases the load on the wings, which, therefore, have to be built stronger, *i.e.*, heavier, than in the ordinary twin-engined biplane with the engines on the wings. When, therefore, Boulton and Pauls have succeeded in building a machine of this type, in which there is still a reasonably large proportion of useful load, this is an achievement which has been rendered possible mainly by virtue of the all-metal construction. In his paper before the Royal Aeronautical Society, Mr. J. D. North, chief engineer of Boulton and Paul, Ltd., expressed the opinion that metal construction would ultimately afford a means of saving weight, and that already something like 20 per cent. of the structure weight could be saved by scientific metal construction. We believe that, as a matter of fact, the saving effected in the case of the "Bodmin" is of this order, and as the machine is a fairly large one, it will be realised that the effect on the useful load is very considerable. Thus, apart from the questions of rapid production, durability, fire-proof qualities, etc., it would seem to have been demonstrated that the employment of high-tensile steels, if skilfully used, can lead to weight savings which, on the one hand, may render possible the production of a type that would not otherwise



THE BOULTON AND PAUL "BODMIN": Three-quarter front view.



THE BOULTON AND PAUL "BODMIN": Three-quarter rear view.



THE BOULTON AND PAUL "BODMIN," TWO 450 H.P. NAPIER "LION" ENGINES: General arrangement drawings, to scale.

be a practical proposition, and, on the other, will increase the useful load or the performance, according to which is the more desired.

As it is mainly the metal construction which has rendered the other feature of the "Bodmin" possible, *i.e.*, the central engine placing, it seems well to devote a certain amount of space to a more detailed reference to the methods of metal construction evolved by Mr. North and his staff of skilled specialists.

With very few exceptions, all parts that are normally made of wood—such as spars, ribs, struts, longerons, etc.—are made, in the Boulton and Paul "Bodmin," of high-tensile steel sheet, rolled, drawn or stamped to the section required. All joints in these built-up sections are made by riveting, no welding being employed. In many places the more usual drawn steel tubes have been replaced by circular section members, manufactured from the flat sheet by processes specially evolved—and patented—by Boulton and Paul, Ltd. In this manner tubes with walls much thinner than could be produced in the ordinary way are made possible, with the result that, as the material is high-tensile steel, a very great reduction in weight can be effected.

To take first the item which formed, probably, the first subject for metal experimental construction, the wing spars are built up as shown in one of our sketches. The sides are formed of "hour-glass" sections, with the flanges turned over, and into the recesses thus formed the edges of the top and bottom strips are passed, the whole being riveted together with very small rivets (probably in the neighbourhood of $\frac{1}{16}$ in. diameter). The spar sides are steadied laterally by short lengths of tube, having a crinkle on the inside of the walls and with their outer edge turned over, thus locking the walls. The top and bottom flange strips are of different sections, according to where they occur. Thus, in the main spars they are rolled to a form of trefoil section, while in the tail plane spars the top and bottom flange strips are simple semi-circles. Where fittings occur the spar walls are reinforced by extra plates riveted to the outside.

The ribs of main planes and tail plane are built up of channel section flanges and struts, braced by U-section diagonal members riveted to the flanges. The internal drag bracing struts are circular tubes, and the means of attaching them to the spars is interesting. Short lengths of tube are built into the spar walls permanently, and on the rear face of the front spar and the front face of the rear spar these short tubes end in a socket carried on a vertical steel plate. The compression struts themselves have similar fittings, and as the plates of strut and fitting are bolted together it is possible to remove a drag bracing strut without interfering with the rest of the wing.

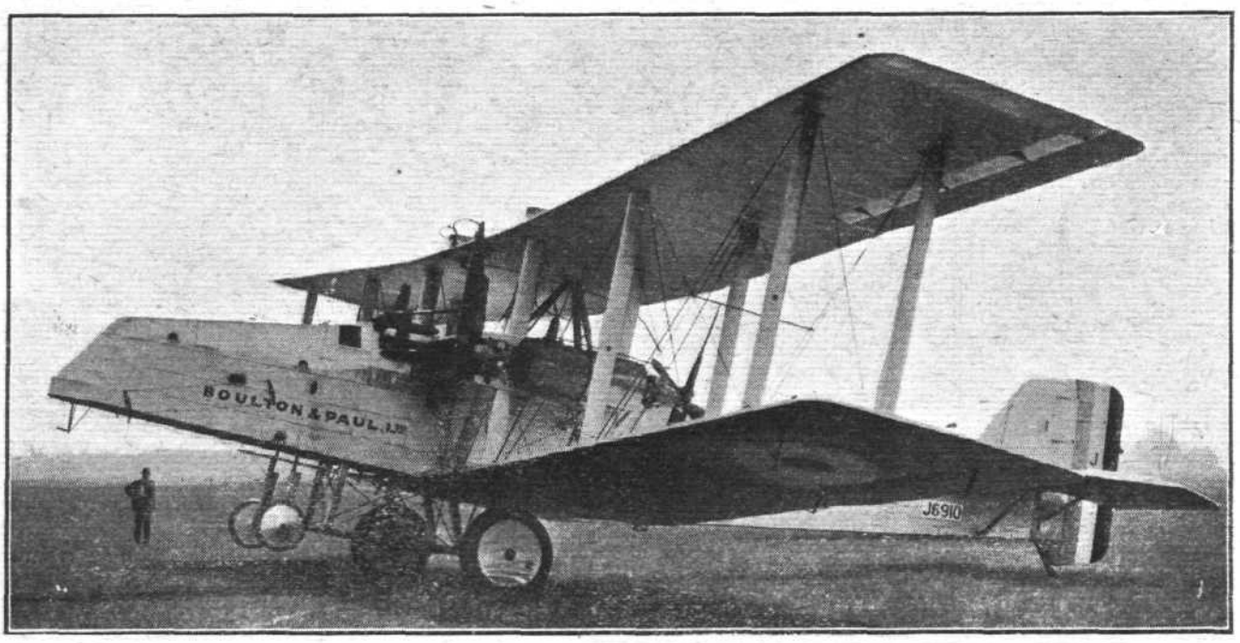
The inter-plane struts, which are in the form of two D-section struts joined back to back by a channel section lacing similar to the wing ribs, are attached, not direct to the wing spars, but to the drag bracing compression struts, so that no torsion is transmitted to the spars. In the case of the tail plane struts a somewhat similar arrangement is followed, with the result that on the rear spar of the tail plane the strut runs *behind* the spar and is attached to a horizontal compression tube inside joining front and rear spars.

The fuselage longerons are of even more remarkable design than the wing spars. They are rolled from the sheet, and are in two parts, the outer and larger of which resembles in section the Greek letter Omega. The smaller completes the approximately circular section of the finished longeron, and both parts have their edges flanged over and joined together by riveting. One of our sketches shows such a longeron, and also the fuselage fittings, which latter are of the simplest form, consisting merely of flat plates bent through a right angle and having small stiffeners riveted into the angle, from which the eye-bolt for the bracing wire is supported. The inner portion of the longeron is, of course, cut away where the fittings occur, as shown in the sketch.

The fuselage struts are tubes formed from the flat sheet, the edges being turned inwards and the resulting tube being prevented from opening by bands placed around it at intervals of 6 ins. or so.

In a description of a particular machine it is impossible to do more than give a brief outline of the constructional methods employed, but it is hoped that sufficient has been said to indicate the general principles upon which the Boulton and Paul forms of all-metal construction are based. In detail individual members vary in the different types of machines, but the particulars given above apply broadly to all Boulton and Paul types, although research and experiments are being carried out constantly, and modifications introduced as a result of experience gained. It will be realised that such work is necessarily costly, but it will be seen that the results obtained are such as to already indicate the correctness of the views of those to whose far-seeing and bold policy of specialising on all-metal construction Boulton and Paul's present position in the very front rank is due. One can but express the hope that future developments will be such that commercially the firm will reap the benefit to which their technical groundwork has entitled them.

Having outlined the salient features of all-metal construction as carried out at Norwich, we will turn to the general design of the "Bodmin," and more particularly to the feature which forms the *raison d'être* of the design, the central engine placing. The machine is a biplane of normal Boulton and Paul lines as regards its wings and fuselage. The two Napier "Lion" engines are, however, placed in, or rather on, the fuselage and drive four airscrews placed some distance out. The two engines are mounted above the fuselage top longerons, leaving the whole of the fuselage space proper free for the engineers to walk along in order to attend to the engines. Between the two engines a small space is left, in which the engineer can stand upright and survey his engines. At this point windows are provided in the fuselage covering, so as to



THE BOULTON AND PAUL "BODMIN": Side view showing small auxiliary front wheels.

light up the interior, and illumination is further provided by electric lights inside the engine room.

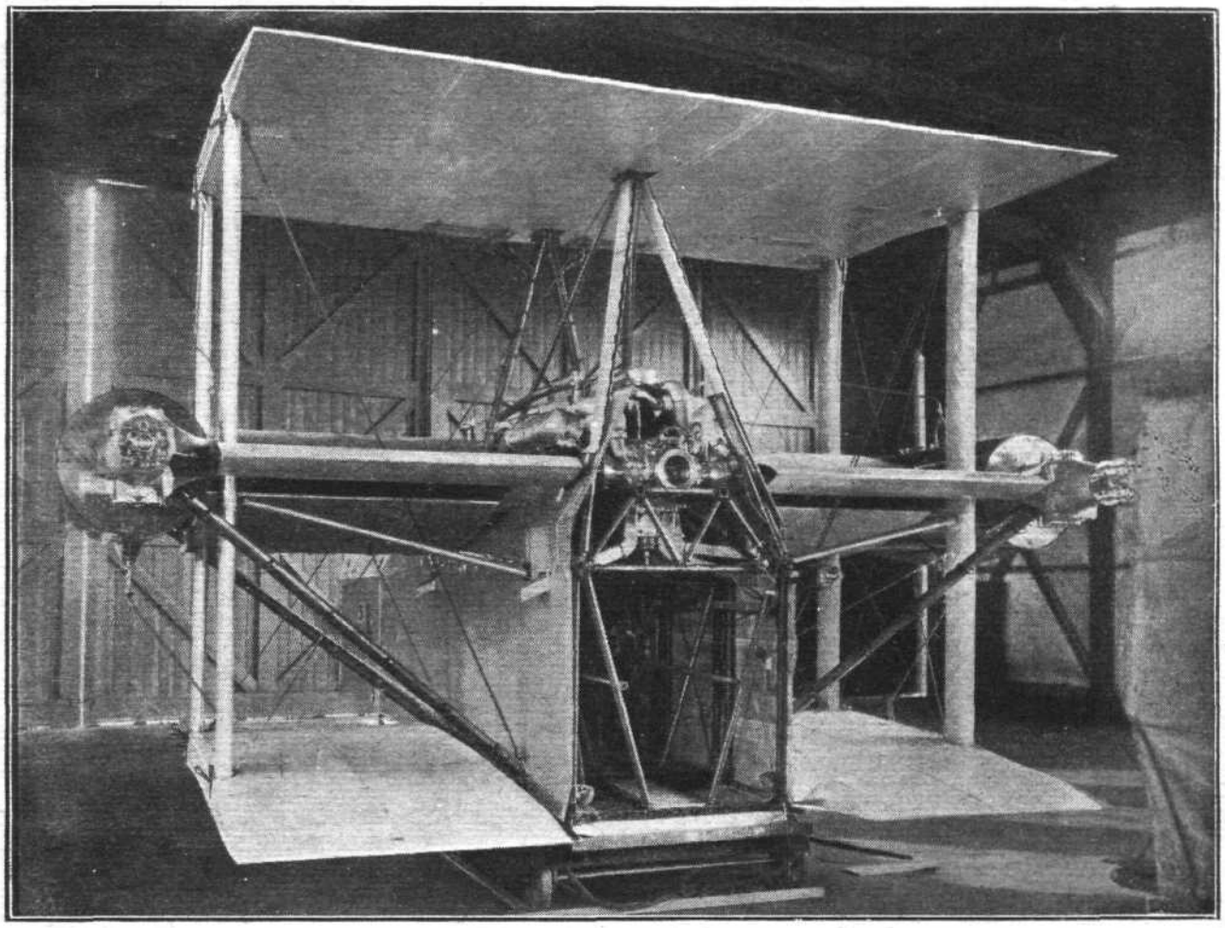
An amazing number of instruments, dials, etc., are to be watched over by the engineer, chiefly on account of the care that has been taken in planning the installation to ensure that the machine shall not be forced down by engine trouble. Thus there are six separate petrol tanks, so arranged that any one can be shut off should it become holed by shot or damaged in any way. The radiators are in six separate sections, any or all of which can be shut off so as to reduce the amount of water lost owing to a leak or puncture to that contained in one cell. All this interconnection naturally means a considerable amount of piping, etc., and at first sight it seems impossible that one man could look after all the revs. counters, thermometers, oil-pressure gauges, taps, etc. Probably, however, an engineer who has once become familiar with the location of the various items would have no difficulty in keeping an eye on everything.

The propellers, as already stated, are mounted some distance out, between the wings. The two front ones are tractors, and run in opposite directions, the port being of right-hand and the starboard of left-hand pitch. The pushers, which are four-bladers, run in opposite direction to the tractors in front of them, *i.e.*, the starboard one is right-hand and the port one left-hand, and are of smaller diameter than the two-bladed tractor screws. The drive is by long shafts and bevel gears, the whole transmission being designed and constructed by Napiers.

In connection with the mounting of the propellers it is of interest to note that the structure carrying the shafts, gears, and propellers is entirely independent of the wing structure, although superficially it might appear to be part thereof. Each shaft runs out from the engines horizontally, and is supported at its outer end by a strut sloping up from the lower longerons of the fuselage. Cable bracing in the plane of the sloping struts completes the structure, but in order to relieve the structure of a certain amount of load a cable is run from the forward gear-case to the top longeron at a point in line with the rear diagonal strut. This cable transmits the propeller thrust to the fuselage.

The radiators are placed in front of, and in fact supported from, the driving shafts to the front propellers, and their length is such as to fill completely the gap between fuselage and propeller shaft. In this position, therefore, the radiators are always subjected to the slip stream from the tractor screws, so that the engines can be run when the machine is standing on the ground or taxi-ing. As already mentioned, the radiators are divided each into three sections. These sections, or cells, are all of equal size, so that an element can be removed from any point and inserted at any other. The consequence is that but a single small element is needed as a spare. Each element is provided with piping to a distributor box in the engine room, and taps for inlet and outlet are provided for each element, so that both inflow and outflow can be regulated or completely shut off.

From the upper and lower edges of the radiators fabric-covered streamline casings project aft, but these do not quite meet at their rear edge, leaving a space for the air to escape.

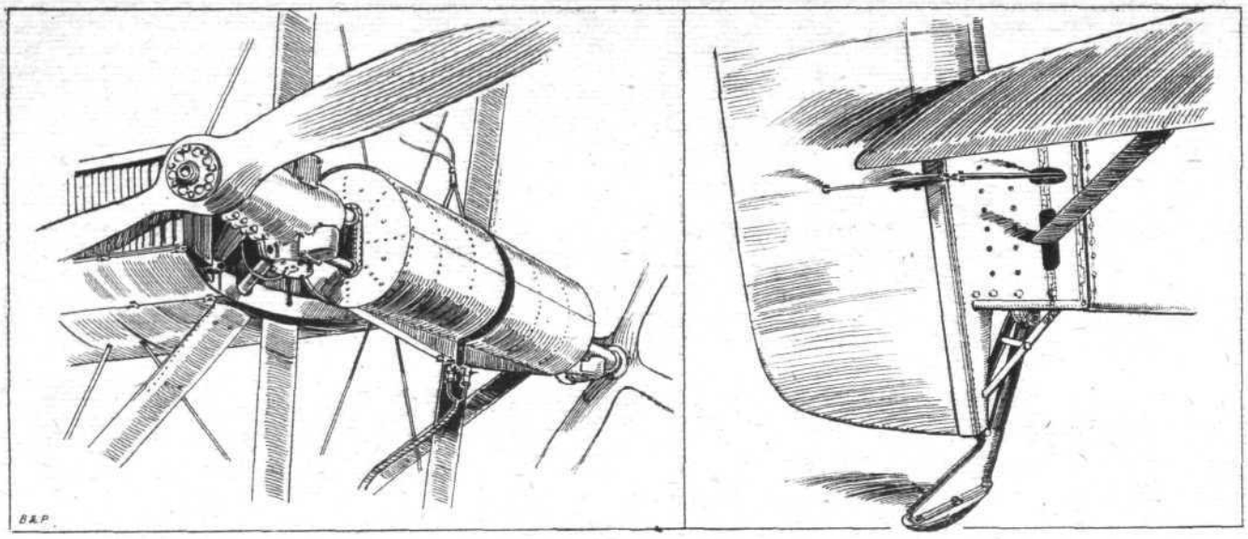


THE BOULTON AND PAUL "BODMIN": View of the engine room and transmission.

In the gap between these two surfaces, some little distance ahead of their trailing edge, are mounted oil radiators which cool the lubricating oil from the bevel gear casings. Placed as they are in the air stream behind the water radiators, the action of these oil coolers is automatic.

The main petrol tanks, of which there are two on each side, are slung on the fore and aft members of the transmission structure. This member is in the form of a beam composed of top and bottom tubes, separated by short tubular struts and braced by wire. The tanks are cylindrical in shape, and in their centre is an opening slightly larger than the beam, so that the tanks can be slipped over the end of the beam. They are then secured in place, fore and aft, by screw-on flanges. Rubber pads are interposed between the beam and the inner walls of the tanks. By undoing the four bolts securing the beam to the gear casings the tanks can be removed very rapidly.

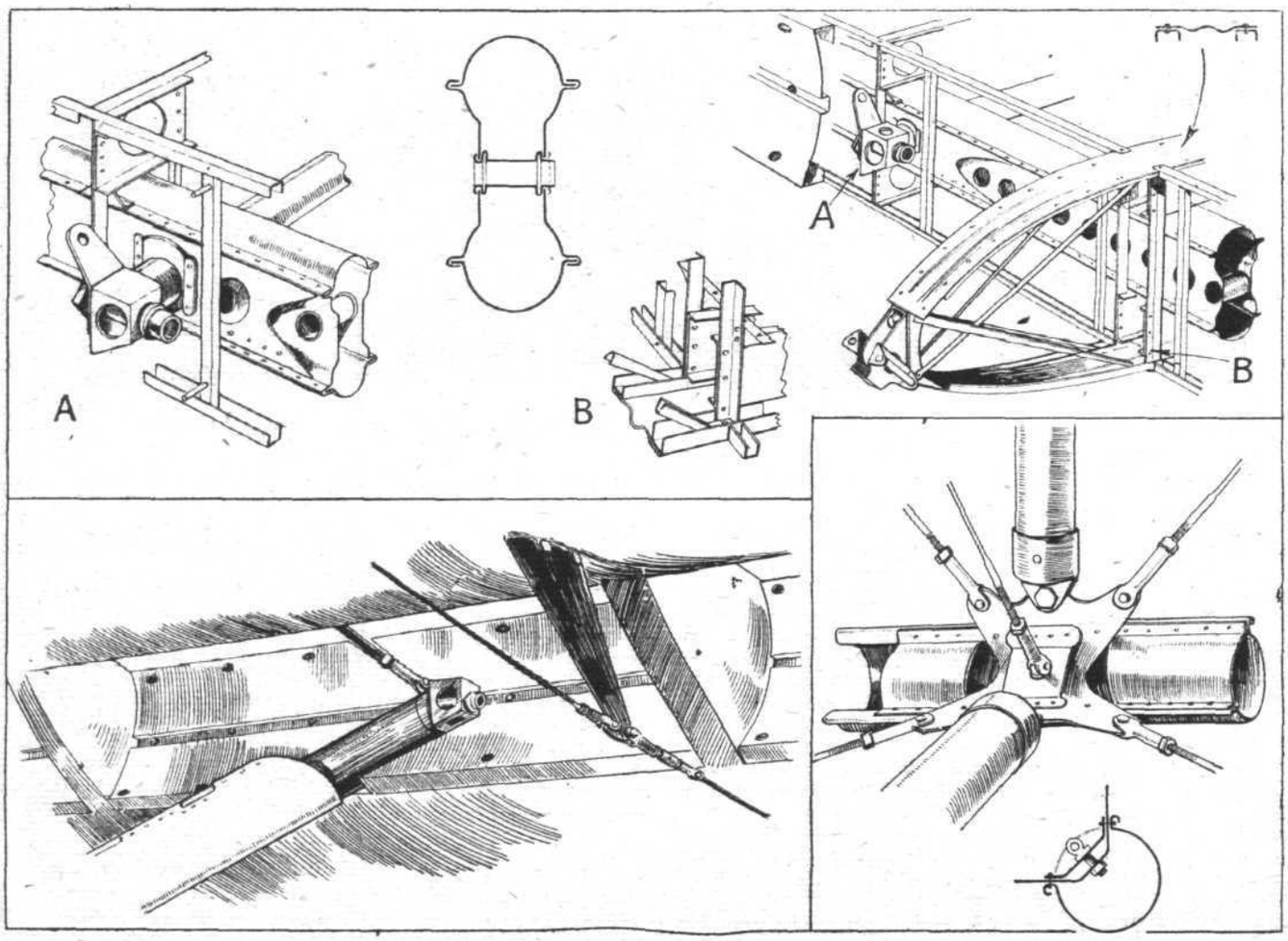
Mounted above the top centre section are another two tanks, one of which is normally used as a gravity tank into which petrol can be pumped from either or all of the four main tanks. The second top tank is not normally in use, but should the gravity tank be holed by a shot the other top tank can be turned on and the gravity tank shut off, so that the loss of petrol is confined to that contained therein. A similar system of inter-connection has been employed in the case of the other tanks, so that it is difficult to see how a complete breakdown



THE BOULTON AND PAUL "BODMIN": On the left, one of the gear casings, the tractor and pusher screws, and two main petrol tanks slung on a tubular braced member. On the right, a view of the tail skid, etc.

of the petrol system could occur. What adds still further to the freedom from any power plant disturbance sufficient to force the machine to come down is the fact that the flying tests have proved that the "Bodmin" is definitely able to fly level on either one of the two "Lion" engines. In this respect this type scores over normal twin-engined machines in that whether one or two engines are running the thrust is always central, as the front engine drives the two tractors and the rear engine the two pushers. Moreover, owing to the fact that screws run in opposite directions, there is no turning moment due to slip stream, and the machine should consequently handle approximately equally well whether gliding or flying on one or both engines.

The undercarriage is of the oleo-pneumatic type, in which the wheels, once the machine is in the air, sink down to the end of their travel, giving approximately 18 ins. of movement when the machine first touches. This naturally provides excellent shock absorption, and the "Bodmin" lands without perceptible shock, and without any tendency to "bounce." The undercarriage "legs" are attached to the front spar of the lower centre-section, giving a very wide wheel track. A pair of smaller wheels is mounted forward of the main ones



THE BOULTON AND PAUL "BODMIN": Details of tail plane, spar and bracing strut attachment. The elevator has leading edge balance, and is carried on brackets from the rear spar. In the lower left-hand corner is shown the attachment of the tail plane bracing strut to the rear face of the spar. On the right, a typical fuselage fitting and section of longeron.

and prevents the machine from nosing over. By fitting this extra pair of wheels in front it has been possible to place the main wheels slightly farther aft than is usual, thus relieving the tail skid of a great proportion of its load.

Ailerons and tail plane are of the leading-edge-balance type, supported on brackets from the rear face of the rear spars, and in order to reduce air losses past the leading edge, aluminium strips, curved to the same radius as that of the balance, have been bolted to the rear spars. This is indicated in one of our sketches. Needless to say, a trimming tail plane is used, operated by a worm, which in turn is actuated by cables and a wheel in the pilot's cockpit.

Reference has already been made to the engine installation, and it only remains to state that the exhaust pipes are of special form, deep from front to back but narrow in width, and with saw-cuts for the escape of the gases. These pipes are made from stainless steel to avoid scaling, and they are built up without welding, the parts being bolted together.

In an article like this it is scarcely possible to deal adequately with all the features of a machine in which there is so much that is novel and unusual, but it is hoped that in the foregoing no point of vital importance has been omitted. Although the Boulton and Paul " Bodmin " is purely a military machine, it may be supposed that some of the features of the central engine placing, and, of course, practically all of the all-metal constructional details, are applicable to commercial aircraft, and if long-distance air transport by heavier-than-air craft is to become a practical proposition it may well be that the engine-in-the-hull type will have to be seriously studied. In that case also the metal construction should prove its worth, as machines used for such a service would certainly have to fly through wide ranges of changing climatic conditions, which might be found to be so severe as to handicap seriously the wood-*cum*-metal construction.

The main characteristics of the Boulton and Paul " Bodmin " are as follows : Length, o.a., 53 ft. 4½ ins. ; span, 70 ft. ; wing area, 1,204·1 sq. ft. ; gap, 9 ft. 6 ins. ; chord, 10 ft. ; weight, empty, 7,920 lbs. ; petrol (230 gallons), 1,660 lbs. ; oil (32 gallons), 320 lbs. ; crew, 540 lbs. ; useful load, 560 lbs ; total loaded weight, 11,000 lbs. ; wing loading, 9·1 lbs./sq. ft. ; power loading, 12·2 lbs./h.p. ; speed at ground level, 116 m.p.h. ; at 10,000 ft., 112 m.p.h. ; at 15,000 ft., 102 m.p.h. ; service ceiling, 16,000 ft. ; climb to 6,500 ft. in 8·9 mins. ; to 10,000 ft. in 16 mins. ; to 15,000 ft. in 35·5 mins.

Married

Flight-Lieut. SEYMOUR STEWART BENSON, A.F.C., son of Mr. and Mrs. R. Seymour Benson, of Middleton St. George, Co. Durham, was married on August 25, at St. Mark's Church, Farnborough, to EVA MARGARET SULLY, daughter of Mr. and Mrs. Robert Alfred Sully, of Hampstead.

The marriage took place on August 14, at All Saints', Northallerton, Yorkshire, of Capt. ALAN RICHARD LASSAM GOODSON, late R.A.F., second son of Sir Alfred Goodson, Bt., and Lady Goodson, of Waddeton Court, Devon, with CLARISSE MURIEL, the daughter of Mr. and Mrs. JOHN WESTOR ADAMSON, of Mount Pleasant, Northallerton.

Flight-Lieut. AUGUSTUS HENRY ORLEBAR, A.F.C., R.A.F., was married on August 22, at St. Martin-in-the-Fields, to Miss TATTIE COOPER.

Flight-Lieut. STURLEY PHILIP SIMPSON, R.A.F., only son of Dr. G. W. Simpson, of Wandsworth, was married on August 29 at Holy Trinity Church, Twickenham, to HILDA MARION, only daughter of Mr. and Mrs. E. O. DRABBLE, of Strawberry Hill, Middlesex.

EDWARD GERALD WHINNEY, R.A.F., eldest son of the late Edward Whinney and Mrs. Whinney, 15, Campden Hill Court, was married on August 18, at St. Mary Abbott's, to EDNA MAIE MOODIE, elder daughter of Mr. and Mrs. Moodie, of Ottawa, Canada.

To be Married

A marriage has been arranged, and will take place very quietly, in September, at St. Margaret's, Westminster, between RUPERT EDWARD DARNTON, D.F.C., elder son of Mr. and Mrs. J. Edward Darnton, of Mackerye End, Herts., and IRIS, only daughter of Mr. and Mrs. JOHN S. MORETON, of Chilworth Manor, Hants.

The marriage arranged between Mr. GUY MAINWARING KNOCKER, R.A.F., and Miss CYNTHIA LAMB will take place on Tuesday, September 25, at St. Mary's Church, Tadcaster.

The marriage of Wing-Commander L. A. PATTINSON, R.A.F., and Miss M. C. CAPPER will take place at St. Martin-in-the-Fields, at 2.15 p.m., on September 12.

The engagement is announced between Flight-Lieut. KENNETH BUCHANAN LLOYD, A.F.C., R.A.F., younger son of Major and Mrs. T. W. Lloyd, of New Quay, Wales, and NELLIE SANFORTH, eldest daughter of Mr. and Mrs. HERBERT JEFFERIES, of Long Ashton, Somerset.

Item

The will of the late Capt. W. LEOPOLD SAMSON, D.F.C. (late R.N.A.S. and R.A.F.) (41), of Ashley Gardens, S.W., barrister, of the Northern Circuit, brother of Air Commodore Samson, has been proved at £2,127.

Captain SILVIO SCARONI, the newly-appointed Air Attaché to the Italian Embassy, left London on August 7 for Gothenburg.

LONDON TERMINAL AERODROME

Monday evening, September 3, 1923

PASSENGER traffic still maintains its high summer level, and machines in each direction are carrying full loads, while passengers are still being turned down. Handley Page Transport created a new record during August when they carried over 1,500 passengers. This is all the more remarkable when it is remembered that they have only three machines, and there is little doubt that the intensive use of aeroplanes, as originated by Colonel Searle on the Daimler Airway, is going a long way towards making commercial aviation a paying proposition, even without subsidies.

The Handley Page service to Zurich is now running regularly, and at the moment only passenger traffic is being handled on this route, although it is possible that in the near future goods will be added to the load.

On Wednesday last the first of the machines on the new mid-week service which the Daimler Airway are running to Berlin left Croydon and arrived at Berlin " O.K." the same evening. Owing to the terrific storm and bad weather on Thursday the machine only got as far as Hamburg on its return journey, completing this on Friday. There are now three through Daimler " air expresses " in each direction between London and Berlin weekly.

On Saturday last the Instone Air Line had no fewer than seven machines in and out between London, Brussels, and Cologne.

The Instone Line on Thursday last week, the day of the great summer gale, created a new record for the journey from London to Cologne. Having a following wind of between 50 and 60 miles an hour, Mr. G. B. Powell, piloting the air liner " City of Washington " (one of the D.H.34s), flew from Croydon to Cologne non-stop, with a full load, in 2 hrs. 7 mins., an average speed of over 153 miles an hour. Lieut.-Col. Henderson, piloting the Surrey Flying Services D.H.9, also made the journey in 2 hrs. 14 mins., but he was over 4 hours on the return flight. Between London and Paris Handley Page Transport completed flights in both directions, and, in spite of the fact that the gale was beam on, the machines were only from 10 mins. to 20 mins. late in arriving at their destinations. The Daimler Airway London-Manchester 'plane was actually 16 mins. early in arriving at Manchester.

Preparations for the aerodrome improvements still continue apace, and I understand that the tenant of the farm will be vacating this at Michaelmas. It is suggested that the farm should be pulled down, and that large permanent hangars be erected on the site.

LIGHT 'PLANE AND GLIDER NOTES

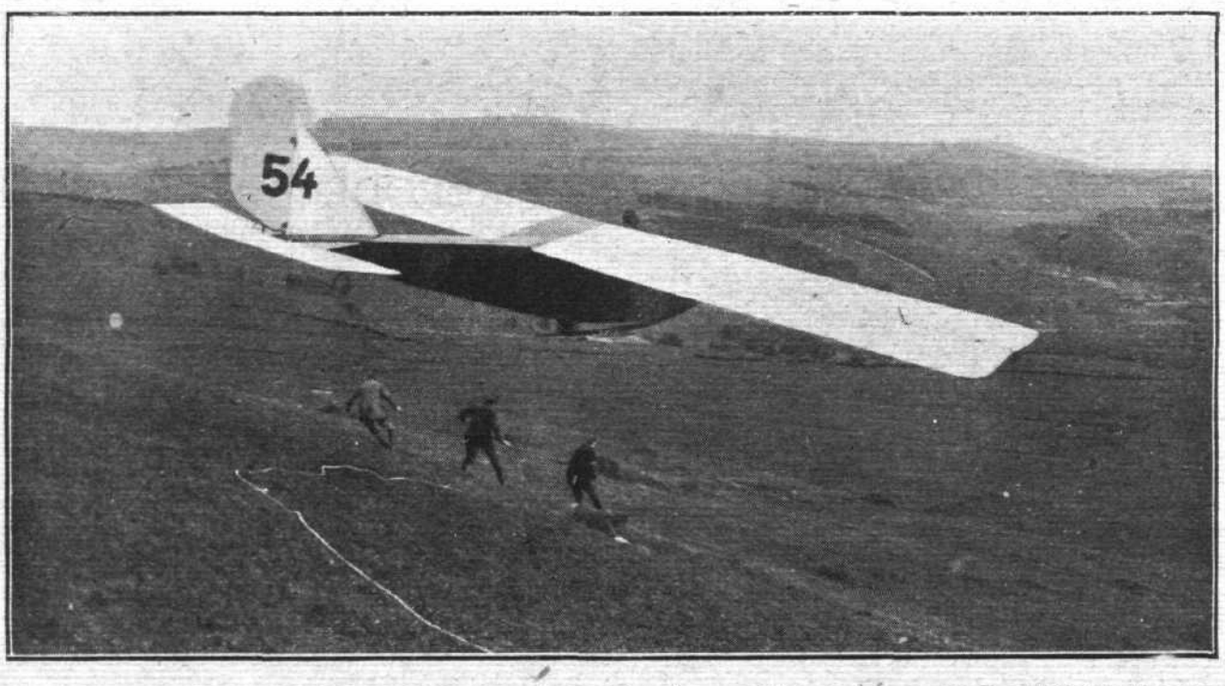
Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, *who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.*

THERE is little to record this week in the way of news of light 'planes being built for the forthcoming competitions. We understand that the Vickers machine is now ready for flying tests. A correspondent who has seen this biplane is very impressed by the workmanship and excellent finish. As a piece of construction the machine is absolutely standard, the fuselage being a wire-braced structure and the wings of the usual equal-span formation, with one pair of struts.

WE have had no official information from the Air Ministry on the subject, but from articles appearing in the daily press it appears that the rules relating to the airworthiness certificates, etc., are to be waived in the case of light 'planes taking part in the forthcoming competitions at Lympne. Thus the machines will be able to fly over the circular course laid out for the competitions, and also, apparently, to fly from their home aerodromes to Lympne, without going through the usual formalities of obtaining registration certificates, identification letters, etc.

A STRIKING MONUMENT ON THE WASSERKUPPE : Unveiled on August 30, this monument to those who have lost their lives in gliding experiments has been erected by public subscription.

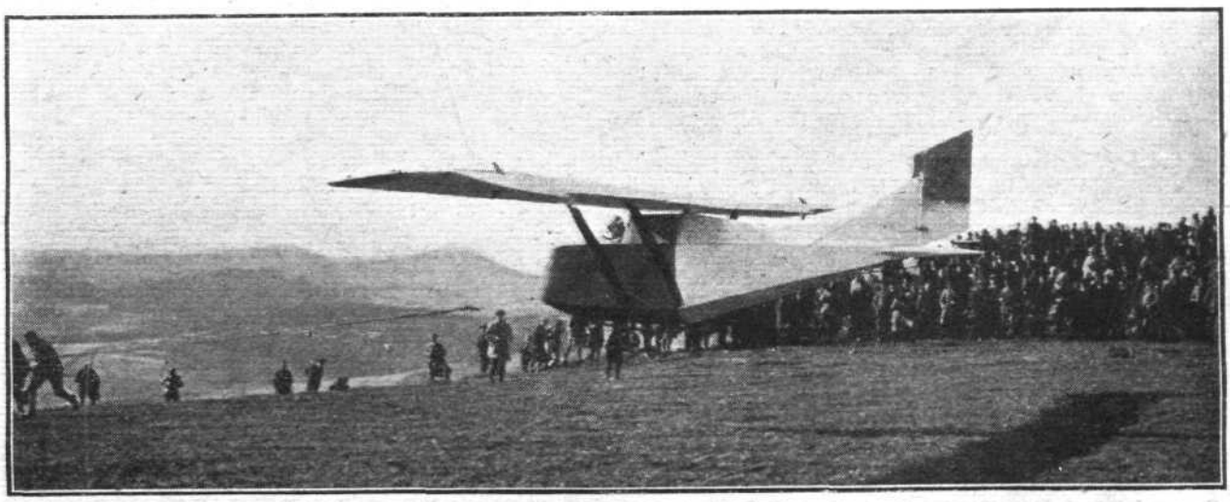
IT has, we understand, been decided that competitors for the Abdulla £500 prize (for the greatest speed) will be admitted only after having passed the transport tests. They must also have previously covered a complete circuit of the course in either the Sutherland or *Daily Mail* competition.



Herr Standfuss starting on the Erfurt glider on which, later, he was killed while making a flight in the presence of General von Ludendorf. While flying in a very gusty wind the wing broke.

THE ESSEN GLIDER IMMEDIATELY AFTER THE START : This machine was badly damaged in a crash, the pilot escaping with a sprained ankle.

The most promising machine of this year's Rhön competition: Herr Martens' monoplane glider "Strolch," on which he has covered a distance of 13 kilometres (8 miles).



Herr Sthamer starting on the "Bremen" for a flight to Gersfeld, where he delivered a mail-bag of letters written and "posted" on the Wasserkuppe. This was probably the first glider air mail.

THE competitions for the S.M.M.T. and British Cycle and Motor Cycle Manufacturers and Traders' Union prizes will be restricted to machines and engines that have been used throughout the week.

* * *

IT is very regrettable that this year's gliding experiments should already have been marred by several fatal accidents. The first occurred at Vauville, when the Thomas glider broke a wing in mid-air, the pilot, Hemmerdinger, being killed instantly.

* * *

LAST week the first fatal glider accident in England occurred when Flight-Lieut. Neville Charles Waltho was piloting a monoplane glider at Milton Hill, near Pewsey, Wilts. It appears that Waltho had been gliding for several minutes and was about to land, when the machine went into a dive. The pilot was thrown out and killed instantly. The machine used was, we believe, similar to the "Brokker," flown by Squadron Leader Gray at Itford last year.

* * *

IN Germany several bad crashes are reported to have occurred in connection with the Rhön competitions. While making a flight in an Erfurth glider the wing broke in the air, and the pilot, Herr Standfuss, was killed. Another pilot, Herr Muttray, was so seriously injured by a crash that it is doubted whether he will survive.

The new Harth-Messerschmidt, piloted by Hackmack. The influence of "Vampyr" design is noticeable.

* * *

CURIOUSLY enough, Herr Standfuss was killed while flying before a number of distinguished visitors, who were present at the unveiling of a monument on the Wasserkuppe to those who have lost their lives as a result of gliding accidents. Among the visitors were Prince Henry of Prussia, brother of the ex-Kaiser, and General von Ludendorf.

* * *

UP to the present but two very remarkable performances have been put up. One of these was a distance flight by Martens on the "Strolch," who is stated to have covered a distance of slightly over 7 miles, and the other was an altitude "record," established by Sthamer on the "Bremen," who reached a height of 1,365 ft. above his starting point.

* * *

IN the light 'plane class no remarkable flights have been made at the time of going to press, although a few gliders fitted with small engines have arrived at the Wasserkuppe and are awaiting favourable weather conditions.

TO GOTHENBURG AND BACK IN A D.H.50

BY ALAN J. COBHAM

[IT will be recollected that the "Traffic Competition" held in connection with the Gothenburg aviation meeting was won by Mr. Alan J. Cobham on a D.H.50, with 240 h.p. Siddeley "Puma" engine. This machine, which was only just completed in time to take part, was fully described in FLIGHT of August 9, 1923. Below Mr. Cobham gives some amusing impressions of his trip to Gothenburg and back, and a short reference to the competition, which he won with 999 points out of a possible 1,000.—ED.]

THE D.H.50 was taken up on Monday, July 28, at 8.15 p.m., on her maiden flight. Everything appeared satisfactory, and she was then taken into the hangar again for completion.

On August 2, at 7 p.m., we started off from Stag Lane Aerodrome *en route* for Rotterdam, where we should enter for the arrival competition in the Gothenburg flying contests. The party on board consisted of Admiral Mark Kerr, who was going to visit his many friends in Sweden; Mr. Walker, our director; and Mr. Norman, who was acting as mechanic. There was a goodly supply of luggage, ranging from sea-chests to top-hat boxes, tools, spare parts, etc. However, all this made no difference, and we bounced into the adjacent atmosphere surprisingly quickly.

For those who have not yet flown the D.H.50, let me tell them it is a pleasure in store. Personally, I think it is the most delightful machine I have ever handled. It is the last word in pilot's comfort, and even in a blinding rainstorm goggles are unnecessary and a perfect view can be obtained. To continue with our flight, after ten minutes' stop at Croydon to pass Customs we flew on to Rotterdam. Nothing extraordinary happened on the way out except that, as usual, having climbed to the peaceful region of 5,000 ft., on arriving at the Channel we ran into heavy piled-up banks of storm clouds and had to cross at 800 ft. At Dunkirk it cleared again, and 1 hr. 50 mins. after leaving Croydon we landed at Rotterdam. True, we had a following wind, but the great surprise of the 50 is that she is 10 miles per hour faster than the D.H.9, and definitely cruises on half throttle at 100 miles an hour. I should say that at ground level her maximum is 120 miles per hour.

A day was spent in Rotterdam, according to the rules of the competition. In the evening a pleasant little dinner party was given to the competitors by the Secretary of the Dutch Royal Aero Club, a really brilliant host. As most people know, the arrival contest was simply a matter of estimating the exact average speed of the flight from Rotterdam to Gothenburg, taken on the basis of the mileage given by the Swedish Aero Club. So that, having decided on a fixed speed, one must work out the exact time that one must take to fly between Rotterdam-Bremen, then Bremen-Copenhagen and Copenhagen-Gothenburg, keeping the exact average speed the whole way and arriving at Gothenburg at 4 p.m., with one hour stop at each control. So, naturally, one started at one's own estimated time from Rotterdam.

On Saturday morning weather forecasts and wind speeds were being discussed everywhere, slide rules were working at terrific speeds, and the decimal point was everywhere being pushed about over many sheets of paper. Having estimated our speed fairly accurately in m.p.h. down to minutes, on wandering round the Junkers I discovered that they were working out their speed in kilometres to the second, and so I dashed back to Mr. Walker, who again had to get busy with slide rule and work out in kilometres and seconds. So, taking an average speed of 157 kilometres an hour, our estimated times worked out as follows:—

Distance. km.	Depart.	h. m. s. a.m.	Arrive.	h. m. s. a.m.	Time. h. m. s.
329	Rotterdam	7 55 0	Bremen ..	10 2 48	2 7 48
376	Bremen ..	11 2 48	Copenhagen	1 29 24	2 26 36
232	Copenhagen	2 29 24	Gothenburg	4 0 0	1 30 36

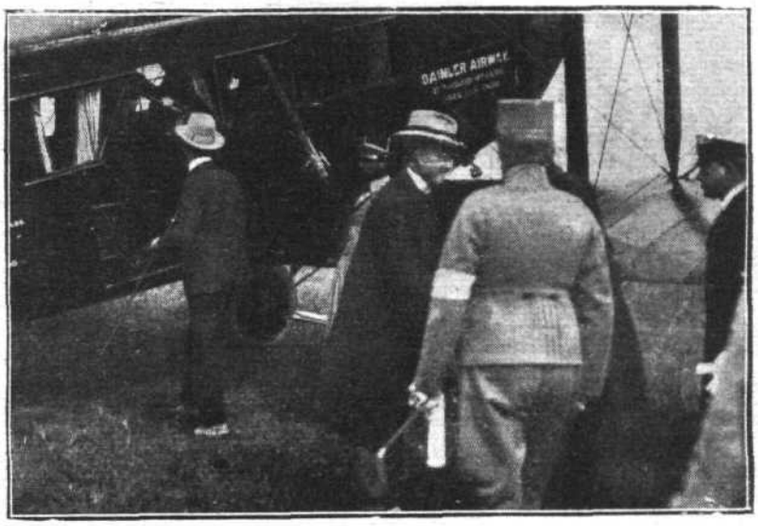
Amid all this turmoil of mathematical calculation with slide rules everywhere, competitors looking rather anxious, there was one—Lieut. Bird, flying the Gloucestershire "Grebe"—who appeared to be very happy, contented and assured about everything. At last some one plucked up courage and timidly asked if he had worked his speed out. "Oh, yes, that's all right." But the enquirer was not satisfied, and pressed for

further details, and the reply was as follows : " I'm not worrying about fancy times, I've only got two hours' petrol, and as long as my blooming fan goes round, I'll get there." However, this statement proved true, for Bird turned up in good form at Gothenburg, having wandered many miles out to sea *en route* from Copenhagen, I understand, before finally hitting Torslanda Aerodrome. Later in the week Bird put up a great show on his wonderful little scout. We pushed off on time and wandered to Bremen with a following wind, and crossed the line with watch in hand at 10.2.48, within two seconds of our estimated time.

Bremen aerodrome was practically under water, and I had the misfortune to get stuck while taxi-ing. My passengers having got out, two mechanics picked up the tail with the idea of dragging the machine out themselves. Evidently they mistook her for a glider. Getting no forward progress, they proceeded to run from side to side with the tail, nicely working the wheels deeper and deeper into the mud, and, strangely, they seemed quite alarmed when I started shouting to them to stop. There was quite a lot of German soldiers about, very decent fellows, and so I collected quite a small army, and after many instructions as to where to push and where not to push, the aeroplane was forcibly drawn out of the mud.

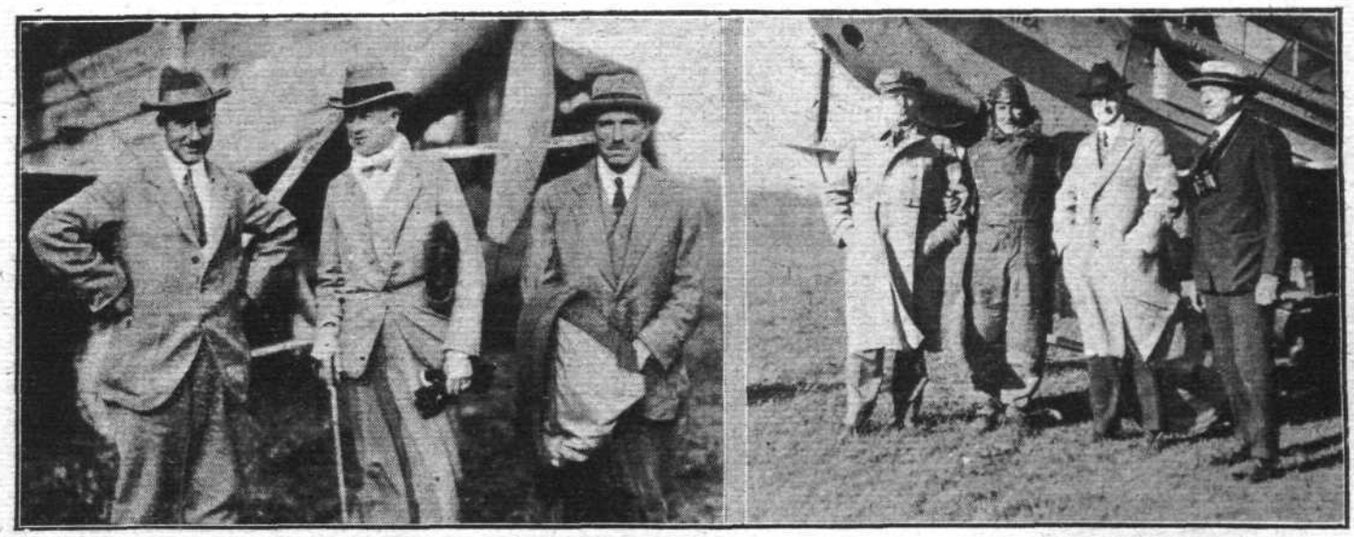
I decided that the only safe way to get off was to get my machine right back on the tarmac between the hangars, but evidently some authority on the aerodrome objected and insisted that I should plant myself in the mud. Now, this may be all very well for the other lightly-loaded machines, but I had 700 to 800 lbs. load on board. The excitement commenced when ten minutes before my starting time, gentle persuasion having failed, I instructed a party of odd people to push my machine back to the required position. By this time the populace were beginning to take sides in the affair, and by the time my 'bus was quietly moving back to the position I wanted, my opponent ordered his men to push me forward to the position he wanted. For some moments there was a battle royal, in which I shouted and pushed and urged my men in one direction and my opponent urged his men in the other. By this time the handling party began to get a little bewildered as to what to do, and success really depended on the one who could shout the most and loudest. I won, and three minutes before starting-time my " Puma " fired first time, my passengers scrambled in, petrol accounts were paid, I gave one leap into the cockpit, the flag dropped, I opened out and we were in the air—incidently almost before we had left the tarmac.

We arrived at Copenhagen on time, but in manœuvring to cross the line I lost about ten seconds. The weather had changed now, and to our dismay we discovered that there was a gale blowing from W.N.W., and it meant going full out to reach Gothenburg on time, for, besides the change of wind, the mileage route for the competition lay across the sea nearly the whole way, whereas a reasonably safe course was round the tops of the capes along the coast, but this, of course, was many miles farther. Up to half-way I was just on time, doing about 115 m.p.h. about 50 ft. over the water, but then we ran into really bad weather, low cloud mist, and heavy rain. I realised that I had set myself too big a task to maintain my 96 m.p.h., which meant about 105 by the route round the coast, and after wandering through the rocks round Sara in the rain, we crossed the line at Torslanda at six minutes past four, arriving fourth in the competition. I was very glad when I heard that the arrival prize for first over the line, also the arrival competition, had been won by the Swedish Officer, for he really deserved it, having bought an old Breguet out of his own pocket and carried the stunt through himself. He flew from Copenhagen to Gothenburg across the sea the whole way, incidentally with a broken rev.-counter.



SIR SAMUEL HOARE AT GOTHENBURG : This photograph, showing the British Air Minister being received on his arrival, was taken just after the Daimler Airway D.H. 34, on which he made the trip, had landed at Torslanda aerodrome.

Sir Samuel Hoare, accompanied by Lady Maud Hoare, arrived on Sunday on time to the minute. This created a great impression, and all flying was stopped immediately the Daimler D.H.34 was sighted. Robinson was piloting, and landed beautifully. A few days later Sir Samuel Hoare gave an invitation to the Royal Family to take a flight in a British aeroplane. It appears that the Royal Family in Sweden had hitherto been forbidden to fly by Act of Parliament, but Sir Samuel Hoare having set the example by flying from England,



THE D.H.50 AT GOTHENBURG : On the left, Mr. Alan J. Cobham on arrival, with his two passengers, Admiral Mark Kerr (centre) and Mr. C. C. Walker, director of the De Havilland Company. On the right, Cobham with some Swedish friends. On Cobham's right is Dr. Malmer, who was responsible for the drawing up of the rules governing the competitions.

this was evidently waived. It was decided that the D.H.50 would be the most suitable machine for the job, and so I took the Crown Prince's two sons, accompanied by Sir Samuel Hoare and Admiral Mark Kerr, on their first flight from Torslanda on August 6.

The traffic competition between Gothenburg and Copenhagen and back started on August 7 and continued for five days. Machines were carefully weighed and loads properly checked and petrol consumption noted, also the correct times taken. The object being the greatest load carried at the greatest speed on the smallest fuel consumption—fuel consumption being the basis for horse-power used. There were also points for punctuality, construction, cabin comforts, etc. However, after a hard struggle, in which the Junkers were my chief competitors, we succeeded in getting 999 out of a possible 1,000, one point being lost because we were 90 secs. late in starting on one morning. The Junkers got 950 points, I think. Great credit is due to Dr. Malmo, who arranged the contests. We won first prize, 15,000 kronen (£880) and the Gold Cup presented by the Crown Prince of Sweden.

Life at Gothenburg was pretty hard. One arrived at the aerodrome at about 7.30 a.m., and after flying to Copenhagen and back generally got back to the hotel at about 7 p.m. Then one must hurriedly dress in time for the banquet at 8 p.m. (There was a banquet every night; such hospitality was never known.) The banquet over and speeches finished by 10.30 p.m., everyone then adjourns to the renowned Rotunda. This is a dancing hall, with tables all round, in the centre of the Jubilee Exhibition. Having been once one takes a solemn oath that they will never go again, but incidentally turns up again the next evening. One then makes a firm resolution that they will be in bed before 2.30 a.m. next evening, with the result that one generally finished up about 3.30 or 4 a.m. I will not dwell upon the agonies of getting to the aerodrome at 7.30 a.m.

On the return journey Admiral Mark Kerr wrote a very charming letter to the Crown Prince's sons, and it was decided that we should deliver it by air as we flew over the Chateau just above Helsingborg. I asked the mechanic to tie a weight to the letter so that it would drop well. This he did thoroughly, for I am sure had I hit the roof of the house it would have gone through same and four floors into the cellar direct.

Under these circumstances I was very careful to avoid the gathering on the lawn, for our arrival had been telephoned ahead. The note fell a little wide but quite safely, and after circling three or four times we crossed the water to Denmark.

On landing at Copenhagen we were greeted by Mr. Bramson (Major Jack Savage's Continental manager for sky-writing). Capt. Florman had telephoned from Gothenburg instructing him to act as his representative and invite Admiral Mark Kerr, Mr. Walker and myself to lunch as his guests. I look upon this as the last word in Swedish hospitality, for our Swedish friends could not have treated us more handsomely. The same night we arrived at Hamburg, and the following day, after a brief stop at Rotterdam, arrived in England, having cruised comfortably all the way at 100 m.p.h.

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THE AERONAUTICAL RESEARCH COMMITTEE'S REPORT

THE Report of the Aeronautical Research Committee for the year 1922-23 has just been published, copies of which may be purchased (2*s.* net) through any bookseller or directly from H.M. Stationery Office, Kingsway, etc. We have not sufficient space to spare to publish this report in full, but the following extracts and references to the more important points contained therein should serve to indicate the nature of the work done by the Committee during the past year.

"Progress," states the Report in the opening paragraph, "in aeronautical research has, throughout the year, been continuous but slow; due in part to the financial stringency necessitated by economy, and in part to the nature of many of the problems that await solution."

Whilst satisfied that there is a distinct improvement in the outlook for research, the Committee lay stress once again on these two points:—

"In the first instance, the money devoted to fundamental research is a small percentage of the total vote for supply and research. In view of the smallness of the Royal Air Force, the importance of research in the comparatively new technique of aeronautical science cannot at the present time be overestimated. To obtain what may be termed quality to make up for lack of quantity it is necessary to allot larger sums for research purposes. In the second instance, the advance indicated by research in any year cannot, in many cases, appear in production until some years later. Thus, inadequate provision now affects greatly the position for future years. Further, the best results are obtainable, in the Committee's opinion, by the retention of the services of a highly-trained technical staff in the various research establishments, combined with adequate provision of mechanical staffs and material. Funds devoted to research by these staffs will give a better return to the State than the offer of large sums as prize money for limited lines of attack on the problems of flight."

The Report goes on to say that the Committee realise that it is difficult to maintain a correct balance between pure research and its applications, since it is easier to meet the needs of the moment than to await the completion of a lengthy research. Steps have, however, been taken to meet this need, and the various organisations connected with aeronautical research are working in close and friendly co-operation with one another, so that it is hoped that it will be possible in the future for the claims of pure research to receive full recognition. An important step towards increased co-ordination of research has been initiated during the past year. The secretary of the Committee, who is a member of the staff of the National Physical Laboratory, now attends the Air Ministry two days a week, and is in direct touch with Air Vice-Marshal Sir Geoffrey Salmond, the Air Member for Supply and Research. He has, also, free access to papers in the Air Ministry dealing with experimental work, and a pass to the various experimental establishments controlled by the Air Ministry. These facilities assist the Committee in its function as the co-ordinating board on aeronautical research.

At the request of the Air Council, a Sub-Committee has been set up to consider the scientific and technical aspects of civil aviation problems connected with the establishment of an Imperial Air Mail Service, and to advise as to the experimental work and construction (both model and full scale) required for the purpose, etc. This Sub-Committee will act as a co-ordinating body between the Civil Aviation Department and the Aeronautical Research Committee, with its technical Sub-Committees.

The most important work of the Committee's organisation is that dealing with the research programmes in hand at the Royal Air Establishment and National Physical Laboratory. Help is also obtained on special problems from the experimental stations at Martlesham Heath and Grain. "The progress of research," it is pointed out, "is often of necessity slow, particularly in the case of what may be termed fundamental research. It is also not easy on many occasions to forecast the final method of application of results arising during research work, but the Committee wish to lay stress on the point that it is on the basis of thorough investigation in the past and coming years that the best attainments, whether of reliability, performance, or manœuvrability, of the aircraft of the next few years must necessarily depend."

The following references are made to the various subjects included in these research programmes, and indicate the progress made during the year:—

Equipment for Experimental Work at the N.P.L. and R.A.E.—Full use has been made of the experimental equipment at the N.P.L. during the year, and steady progress has resulted from the model work in the wind channels, etc. At the R.A.E. the curtailment in numbers of staff for running the wind channels, which could, if funds permitted, be employed continuously on useful research work, has retarded the progress of some of the investigations. The restoration of the staff is a matter for consideration.

With full-scale work, owing to the transfer of the flying previously carried out at Biggin Hill, conditions have been somewhat abnormal, and increased facilities and personnel in certain directions may be needed.

Aerodynamics.—Safety has been a first consideration, and in this connection much full scale and model work has been completed and projected, both on the stability of aeroplanes and on various types of control. This section is dealt with very fully in the Report, but we cannot do more than briefly refer to some of the more important items. The Committee have recommended the construction of three two-seater biplanes solely for experimental purposes; two of these have already been ordered. A further proposal has been made for the design and construction of an undercarriage capable of absorbing a specially large amount of shock. Encouraging results have been obtained with full scale experiments on

stalled flights, but although, it is stated, maintained stalled flight is definitely possible, neither the stability nor the control of the aeroplane are such that flight near the ground may yet be regarded as safe. We hope to refer in detail to the experiments carried out in this direction on some future occasion.

Much work has been completed, and a report will shortly be issued, in connection with the investigation of scale effect.

Amongst other matters under discussion the Committee have expressed a wish that some work on gliders might be commenced by the Air Ministry, and facilities provided for co-operation between glider clubs and the research establishments. At the same time the Committee have replied to an enquiry from the Air Ministry that they do not at present see their way to laying down a direct programme of experimental research with gliders, although they do not wish to neglect this new avenue of exploration into the problems associated with flight. In particular, advance is resulting from experiments on gliders with small engines, corresponding with lightly loaded aeroplanes of about 2 lbs. per square ft., a suggestion first commended by the Committee in 1920.

Many other matters receiving attention are described in the Report and in detail in the Supplement. They include experiments on sounds from airscrews, the application of the Prandtl vortex theory of the flow over aerofoils as applicable to aeroplane wings and to airscrews, the development of instruments for full scale research, the improvement of wind channel technique, the discussion of the results of the now completed tests on the family of airscrews, and a general research on thick and high lift wing sections.

Seaplanes.—Research on seaplane problems has also received attention, and the William Froude tank at the N.P.L. has completed a number of tests on flying boats for the Air Ministry. Further important investigations are to be carried out during the coming year.

Airships.—A special Panel formed to examine the validity of the methods in use for calculating the stresses in airship structures have reported, giving the outline of a new general theory for the calculation of the stresses in this type of structure.

Engines.—Research with engines include type tests on certain foreign engines—from which the conclusion is drawn that they are not superior to British designs of the same period, experiments on a single-cylinder direct-injection heavy-oil engine, magneto problems, etc., etc.

Accidents.—The Accidents Investigation Sub-Committee have gone fully into the question of accidents during the year. From their experience in investigating accidents which have been referred to them from time to time, and from much other incidental information, this Sub-Committee have been brought to the conclusion that the stoppage of the power plant is one of the most frequent initial elements in an accident. The minimisation of such stoppages is, says the Report, therefore imperative.

Fire Prevention.—The question of fire prevention has received much attention, resulting in the recommendation of certain precautions in the construction and installation of the power plant. A report on this subject was published in FLIGHT for August 2 last.

Navigation.—The Committee have been kept informed of progress in various directions with instruments for aerial navigation, and several types of turn indicator have been tried out in flight.

Materials.—A great deal of experimental work on fatigue in metals has been carried out at the Government establishments and at the universities. Several theories of fatigue have been proposed, but the complete explanation has not yet been found. Work on the electro-deposition of various metals on aluminium with a view to the prevention of corrosion has been carried out.

Questions relating to fabrics and dopes have received some consideration, but the programme of work on this subject has been appreciably reduced.

THE ROYAL AIR FORCE

London Gazette, August 28, 1923

Air Commodore E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., relinquishes the appt. of Air Secretary; Aug. 17.

General Duties Branch

The following are granted short service commns. as Flying Offrs., with effect from, and with seny. of, the dates indicated :—F. C. Farrington, M.C. (Lieut., R.A.R.O.); Aug. 20. F. H. Woolliams; Aug. 15.

The following Pilot Offrs. are promoted to rank of Flying Offrs. :—S. S. Kirsten; Aug. 1. T. C. Dodd; Aug. 3.

The following are restored to full pay from half-pay :—*Flight Lieut.*—A. W. Symington, M.C.; Aug. 20. *Flying Offr.*—C. H. Harrison; July 9 (substituted for *Gazette*, July 27). *Observer Offr.*—J. Bowen; Aug. 27.

The following are transferred to the Reserve, Class A :—

Flying Offr.—G. E. Pratt; Aug. 13. A. S. White, A.F.C.; Aug. 29.

Stores Branch

Flying Offr. W. A. G. Goldsworthy is restored to full pay from half-pay; Aug. 27.

Medical Branch

Flying Offr. J. D. Leahy, M.C., M.B., B.A., is granted a permanent commn., Aug. 29.

Reserve of Air Force Officers

Class A

The following are granted commns. on probation in ranks stated in General Duties Branch (Aug. 28) :—

Flying Offrs.—J. Baird, K. W. Brewster, M.C., A. Dickson, W. J. Hutchinson, A. E. de M. Jarvis, D.F.C., W. B. Kelly, R. W. Reeve, D.F.C., M.M.

Pilot Offr.—J. Fairbairn.

London Gazette, August 31, 1923

General Duties Branch

Squadron Leader: H. Payn, A.F.C., is transferred to the Reserve, Class A; Sept. 1.

Flying Officer: G. F. Lines, M.C., resigns his short service comm.; Sept. 1.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified :—

General Duties Branch

Squadron Leaders: H. F. A. Gordon, O.B.E., to No. 100 Sqdn., Spittlegate. 10.9.23, to command on transfer to Home Estab. A. W. Tedder, to R.A.F. Depot. 6.8.23, pending disposal. J. V. Steel, O.B.E., to Electrical and Wireless School, Flowerdown. 1.9.23, for long course of instruction.

Flight Lieutenants: H. Leedham, to Electrical and Wireless School, Flowerdown. 1.9.23, on transfer to Home Estab. T. O. Clogstoun, to No. 7 Sqdn., Bircham Newton. 1.9.23. F. H. Laurence, M.C., to half-pay list. 1.9.23, pending embarkation overseas. F. O. Soden, D.F.C., to Electrical and Wireless School, Flowerdown. 1.9.23, for long course of instruction. J. A. MacNab, to R.A.F. Base, Calshot. 3.9.23. C. R. Steele, D.F.C., to No. 10 Group, Headquarters, Lee-on-Solent. 3.9.23. M. H. Coote, to No. 2 Flying Training School, Duxford. 3.9.23.

Flying Officers: G. R. O'Sullivan, A. W. Wood and S. W. Smith, all to R.A.F. Depot (non-effective pool). 8.7.23, on transfer to Home Estab. D. d'H. Humphreys, to R.A.F. Depot. 8.7.23, on transfer to Home Estab. W. R. K. Atkinson, to No. 208 Sqdn., Constantinople. 1.8.23. G. Horsfield, to No. 55 Sqdn., Iraq. 8.7.23. J. G. Horne, to R.A.F. Base, Calshot. 1.9.23, for course of instruction. J. Bowen, to R.A.F. Depot. 27.8.23, pending disposal. O. V. Lee, to School of Army Co-operation, Old Sarum. 22.8.23, pending next course of instruction. F. H. Woolliams, to R.A.F. Depot. 15.8.23, on appointment to a Short service Commission. G. W. Higgs, to Night Flying Flight, Biggin Hill. 22.8.23. F. C. Baker, to R.A.F. Depot (non-effective pool). 22.7.23, on transfer to Home Estab. H. C. Pyper, to No. 7 Group Headquarters, Andover. 1.9.23. R. H. Wathes, to No. 208 Sqdn., Constantinople. 7.8.23. C. J. Poole, to No. 3 Group Headquarters, Spittlegate. 1.9.23. A. J. Rankin, to R.A.F. Base, Calshot. 4.9.23. A. H. Love, to Embarkation Staff, Suez. 7.8.23. F. C. Farrington, M.C., to R.A.F. Depot. 20.8.23, on appointment to a Short Service Commission pending disposal. C. H. A. Farn and S. J. Stocks, both to R.A.F. Depot. 22.8.23 on appointment to Short Service Commissions pending disposal. R. S. Higgens, to No. 1 Flying Training School, Netheravon. 1.9.23. B. W. T. Hare, to No. 5 Flying Training School, Shotwick. 1.9.23. E. A. Slater, to No. 41 Sqdn., Northolt. 15.9.23. N. M. Ffrench, to No. 32 Sqdn., Kenley. 15.9.23. C. E. Bowden, to No. 24 Sqdn., Kenley. 23.8.23, on appointment to a temp. commn. on being seconded from the Army. A. F. Wynne and F. L. Pearce, both to No. 2 Flying Training School, Duxford. 1.9.23. P. H. Hunter, to Stores Depot, Egypt. 1.7.23. G. N. Coward, to R.A.F. Base, Calshot. 15.9.23, on transfer to Home Estab. H. P. G. Ovendon, T. Humble, C. N. Ellen, D.F.C., C. P. Brown, D.F.C., D. d'H. Humphreys, H. A. L. Pattison, R. Jones, G. P. H. Carter, S. C. Black, M.M., and E. R. C. Hobson, D.F.C., all to Electrical and Wireless School, Flowerdown. 1.9.23, for long course of instruction. M. M. Freehill, D.F.C., to Electrical and Wireless School, Flowerdown. 23.8.23, for long course of instruction. F. G. Gibbons, D.F.C., to Aden Flight, Egypt. 14.8.23. D. P. Hadow, to R.A.F. Depot. 29.8.23, on appointment to a short service commn.

Pilot Officers: F. R. D. Swain, H. C. E. C. P. Dalrymple, L. E. Maynard, R. V. M. Odbert and O. B. Swain, all to R.A.F. Depot, pending disposal. 20.8.23, on completion of course of instruction at 5 F.T.S. C. Denison and A. C. W. Richards, both to R.A.F. Base, Calshot. 1.9.23, for course of instruction. I. B. Gray, to No. 1 Flying Training School, Netheravon. 6.8.23, on transfer to Home Estab. to complete course of instruction. B. V. Reynolds, to R.A.F. Base, Leuchars. 1.9.23, pending allocation to a Flight. T. J. Woods, N. P. C. Mellor, E. C. Roark. D. G. Pinnell, D. S. Brookes, H. V. Michell and J. M. Darrock, all to R.A.F. Depot. 1.9.23, pending disposal on completion of course of instruction at 5 F.T.S. J. A. Ryper and A. G. S. Tuke, both to No. 24 Sqdn., Kenley. 29.8.23. W. H. Phillips and W. J. E. Rodwell, both to R.A.F. Depot. 1.9.23, on completion of course of instruction in Aviation.

Stores and Accountants Branch

Squadron Leader (*Accounts*) W. G. W. Prall, to R.A.F. Depot. 1.8.23, pending disposal.

Flying Officer (*Stores*) W. A. G. Goldsworthy, to No. 2 Sqdn., South Farnborough. 27.8.23.

Medical Branch

Flight Lieutenant A. F. Rook, M.R.C.P., D.P.H., to R.A.F. Central Hospital, Finchley. 27.8.23.

Flying Officer G. Clark, M.B., to R.A.F. Hospital, Cranwell. 1.9.23.

Chaplains' Branch

Rev. G. L. Robinson, D.S.O., to School of Technical Training (Men), Manston. 2.9.23. Rev. A. W. Brown, to Central Flying School, Upavon. 2.9.23, on appointment to a short service commn. Rev. D. H. Gillan, M.A., B.D., to Headquarters, Cranwell. 1.9.23.

By Douglas B. Armstrong

Newfoundland's New Air Stamps

Newfoundland is on the point of issuing two particular postage stamps for use on aerial correspondence, one of which, 10 cents green and black, will depict an aeroplane over the Narrows at the entrance to the harbour of St. John's, whilst the other, 15 cents blue and brown, shows the Vickers-Vimy aeroplane at Quidi Vidi waiting for the first trans-atlantic flight in 1919. They will be used chiefly on letters to Labrador and the northern Settlements.

The first design is one of a series of three essays for air-mail stamps prepared in the summer of 1919, when the inauguration of a regular air post to Halifax, N.S., was mooted. The other two represented an aeroplane in flight and the head of a caribou.

Latest from Colombia

The semi-official air-post service maintained by the Sociedad Colombo-Alemana de Transportes Aereos, under contract with the Republic of Columbia, is a model of efficiency, and is very largely patronised by the business community. By the use of this service a saving of several days is effected in transmission of correspondence from the coast to the interior. Supplementary charges on air-post letters, etc., are defrayed by special stamps issued by the company, in addition to the normal postage which is paid in ordinary Columbian postage stamps. A new series of stamps for the S.C.A.D.T.A. has just been printed at the State Printing Office, Berlin, differing from previous issues in that the design represents a hydroplane in flight instead of an aeroplane as heretofore, and the inscription reads, "Servicio de Transports Aereos en Colombia" instead of "Servicio Postal Aereo de Colombia." The colours of certain denominations have also undergone a change.

The aero stamp collection affords an example *par excellence* of the modern postal and historical school of Philately, which is as far removed from the popular conception of a schoolboy's stamp album as is a gallery of old masters from a collection of cigarette cards. The philatelist of today is a student, not only of stamps, but of postal history, treating his stamps as symbols of the system that gave them birth. In this way, by means of liberal annotation and extra-illustration the modern stamp collection becomes in effect a documentary record of postal progress. This method of collecting is especially applicable to air stamps and the majority of aero-philatelists favour the "Graingerised" or extra-illustrated collection as calculated to enhance both the interest and value of their philatelic treasures. Air stamps provide even greater possibilities in the way of documentary embellishment than perhaps any other phase of stamp collecting, since the air stamp collection embraces of necessity many items that are barred from the pages of the everyday stamp album, such as special cancellations, quasi-official labels and even souvenir stickers.

Of late there has been much controversy as to what may or may not be legitimately included within the purview of aero-philately. Many enthusiasts favour insertion of portraits of aviators with newspaper cuttings relating to the mail flights made by them, but it was certainly stretching a point when at a public stamp exhibition, one exhibitor showed with his stamps a portion of an aeroplane propeller! After all "the stamp's the thing," and whilst a certain amount of annotation tends to enhance the attraction of an album page, over elaboration in this respect has the reverse effect by dwarfing the main feature of the exhibit. A nice sense of discrimination is therefore a most necessary attribute to the successful arrangement of a collection of air post stamps.

Readers are invited to forward to the Editor of FLIGHT *letters, etc., bearing aerial stamps or postmarks for mention in this column, as well as out-of-the-way varieties, etc.*

We shall also be pleased to hear from correspondents interested in air-stamp collecting, and to answer any queries.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS
(London Aero Models Association)

September 8, competition for the Paddington Cup will be held on the Paddington and District Aero Club ground at Sudbury, at 4.30 p.m. At the same time an attempt will be made to hold competitions for the *Model Engineer* No. 1 and No. 2 Cups, which have not yet been won this year.

September 9, at 11 a.m., attempts on the glider records will be made at Parliament Hill.

September 15, open Competition No. 7 for the "K. and M.A.A." Cup will be held at Hackney Marshes, at 3.30 p.m.

September 22, at Hackney Marshes, attempts on the general records will be made at 2.30 p.m.

September 29, competition for the "D. H. Pilcher" Challenge Cup will be held at Wanstead Flats at 3.30 p.m.

Any one desirous of particulars of the above competitions should communicate with the Competition Secretary, Mr. C. Bayard Turner, 21, Lanercost Road, Upper Tulse Hill, S.W. 2.

A. E. JONES, Hon. Sec.

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PUBLICATIONS RECEIVED

U.S. National Advisory Committee for Aeronautics. Report No. 159.—Jet Propulsion for Airplanes. By Edgar Buckingham. Report No. 163.—The Vertical, Longitudinal and Laterial Accelerations Experienced by an S.E.5A Airplane while Manœuvring. By F. H. Norton and T. Carroll. Report No. 164.—The Inertia Coefficients of an Airship in a Frictionless Fluid. By H. Bateman. Report No. 167.—The Measurement of the Damping in Roll on a J.N.4H in Flight. By F. H. Norton. Report No. 168.—The General Efficiency Curve for Air Propellers. By W. S. Diehl. Report No. 170.—A Study of Longitudinal Dynamic Stability in Flight. By F. H. Norton. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1922

Published September 6, 1923

12,344. F. J. W. and P. A. PURTON. Sustentation or propulsion of aircraft. (201,989.)
12,778. H. JUNKERS. Shock-absorbers. (179,552.)
12,902. A. V. ROE AND CO., LTD., and R. CHADWICK. Metal-tipping for propellers. (202,011.)
13,304. F. ATHEY. Rotary motors. (202,035.)
17,348. E. ROBINSON. Surfaces of aircraft members. (202,118.)
21,890. LUFTSCHIFFBAU ZEPPELIN GES. Airships. (190,446.)

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